LISTING OF THE CLAIMS

1. – 14. (Cancelled)

15. (Previously Presented) A micro vial assembly for performing microwave-assisted chemical reactions on small volumes, the assembly comprising:

a micro-wave transparent reaction vessel having an open upper end and a closed bottom end;

a cap having a through hole;

a sealing diaphragm; and

a sleeve,

wherein the sleeve is formed with a through hole, the vessel extending axially through the sleeve, the cap securing the vessel to the sleeve while clamping the diaphragm for sealing the open upper end of the vessel, the open upper end of the vessel being formed with a widening portion, the widening portion being received in a corresponding recess formed in an end plane of the sleeve, and the recess providing a seat for the widening portion in the open upper end of the vessel.

16. (Previously Presented) The micro vial assembly of claim 15, wherein the upper end of the sleeve is formed circumferentially for engagement with the cap, the sleeve having a first diameter portion running from the upper end to meet a reduced diameter portion in the lower end of the sleeve.

17. (Previously Presented) The micro vial assembly of claim 16, wherein the portion of reduced diameter in the lower end of the sleeve is a truncated cone.

18. (Previously Presented) The micro vial assembly of claim 15, wherein the widening portion of the vessel and the seat in the end plane of the sleeve are both conical in shape.

19. (Previously Presented) The micro veal assembly of claim 15, wherein the open end of the vessel is defined by a rim protruding above the upper end of the sleeve, when the vessel is supported in the sleeve, the rim being dimensioned to be depressed in the lower side of the diaphragm.

20. (Previously Presented) The micro vial assembly of claim 19, wherein the rim has an inner perimeter extending transversely to the diaphragm, sealing the open end of the vessel.

21. (Previously Presented) The micro vial assembly of claim 20, wherein the inner perimeter of the rim defines a portion of the vessel cavity having a first radius, said first radius portion meeting a second portion, the reducing radius portion smoothly transforming into a portion of continuous radius defining a reaction chamber of the verse cavity.

22. (Previously Presented) The micro vial assembly of claim 15, wherein a bottom of the vessel is formed through a radial compression of the vessel, located above the terminal end of the vessel.

23. (Previously Presented) The micro vial assembly of claim 15, wherein the vessel has an inner volume including a head-space volume which is less than 20 times that of the smallest reaction mixture volume contained in the vessel.

24. (Previously Presented) The micro vial assembly of claim 15, wherein the vessel is dimensioned for performing microwave-assisted chemical reactions on small volumes of 500 µl or less.

25. (Previously Presented) A system for performing microwave- assisted chemical reactions on small reaction mixture volumes, comprising a micro vial assembly according to claim 15.

26. (Previously Presented) The system of claim 25, wherein the outer perimeter of the sleeve is dimensioned for bridging the radial distance between a wall of the vessel and an entrance diameter, of a microwave cavity in the system.

27. (Previously Presented) A method of using a micro vial assembly according to claim 15 for performing microwave-assisted chemical reactions, including the step of initiating or accelerating said chemical reactions.

28. (Previously Presented) A method of using a system according to claim 25 for performing microwave assisted chemical reactions, including the step of initiating or accelerating said chemical reactions.

29. (Previously Presented) A micro vial assembly for performing microwave-assisted chemical reactions on small volumes, the assembly comprising:

a cap having a through hole;

a sealing, elastic diaphragm; and

a sleeve having a through hole,

wherein the cap, diaphragm, and sleeve are configured to assemble with a micro wave transparent reaction vessel having an open upper end and a closed bottom end, so that upon assembly:

the vessel extends axially through the sleeve,

the cap secures the vessel to the sleeve and clamps the diaphragm for sealing the open upper end of the vessel,

the open upper end of the vessel is formed with a widening portion,

the widening portion is received in a corresponding recess formed in an end plane of the sleeve, and

the recess provides a seat for the widening portion in the open upper end of the vessel.